APPENDIX K

U.S. FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ASSESSMENT

BIG OAKS NATIONAL WILDLIFE REFUGE
Jefferson, Jennings, & Ripley Counties, Indiana

FIRE MANAGEMENT PLAN

U.S. Fish and Wildlife Service
1661 W JPG Niblo Road
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ENVIRONMENTAL ASSESSMENT

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FIRE MANAGEMENT PLAN

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I. PURPOSE AND NEED

A. Purpose

Policy of the U.S. Department of the Interior states that managers of refuge lands with vegetation capable of sustaining fire will develop a fire management plan (FMP) (910 DM 1). The Fish and Wildlife Service's Fire Management Handbook (621 FW 1.4-5) states that, "Every area with burnable vegetation must have an approved Fire Management Plan." This Environmental Assessment (EA) explores the various alternatives in which Service policy can be carried out, consistent with agency direction and analyzes the foreseeable impacts associated with an integrated fire management program.

This EA has been developed to evaluate environmental consequences of the FMP being created for the newly established Big Oaks National Wildlife Refuge. The FMP is one of many step-down plans that build upon management actions adopted in the Refuge's Interim Comprehensive Conservation Plan (CCP). The Interim CCP designates 2 Grassland Focus Areas, comprising 16,000 acres, where prescribed burning is the preferred method of maintaining early successional habitats including grasslands (Interim CCP 1.8 and Figure 4). The Interim CCP declares that wildland fire suppression needs will be outlined in the FMP (Interim CCP 1.9). This FMP is further necessary to meet Service, Departmental and National policy mandates concerning fire management.

B. Need

The FMP for the Refuge has been developed to provide direction and continuity in establishing operational procedures to guide all fire management activities. The Refuge FMP is needed to guide us while implementing resource management objectives as defined in our interim management document titled *Interim Comprehensive Conservation Plan for Big Oaks National Wildlife Refuge*. The FMP will be updated as needed to comply with all permanent management plans as they are developed for this new Refuge. The Refuge does not currently have a FMP.

The goal of this FMP and the Alternatives developed is the management of wildland fire to:

a. Provide for the protection of life and property.
b. Provide for protection of habitats required by endangered and threatened species.
c. Implement a safe and cost effective program of resource protection and enhancement.
d. Reduce hazardous fuels; and protect native biotic communities.

The alternatives detailed in this document will accomplish these goals to varying degrees.

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C. Decisions that Need to be Made

Through public and staff input, the Regional Director (Region 3) of the Fish and Wildlife Service must decide whether to select the preferred alternative (Proposed Action) or one of the other alternatives as presented in this EA or to select an entirely new alternative that was not developed for this EA. The Regional Director must then decide whether the selected alternative is at a significance level that requires an Environmental Impact Statement be developed or whether a Finding of No Significant Impact (FONSI) determination can be made.

D. Background

Big Oaks NWR was established on June 30, 2000, as an overlay refuge on approximately 50,000 acres north of the historic firing line of the former Jefferson Proving Ground. Through a real estate permit from the Department of the Army, the Service maintains Big Oaks NWR as habitat for endangered species, migratory birds and other wildlife in order to further the purposes of the Endangered Species Act and the Fish and Wildlife Act.

The wide array of both resident and migratory species found on the Refuge is due to the varied habitat types found in the grassland/forest/wetland complex. The mix of forests, grasslands, forested wetlands, emergent marsh, and early successional stages of vegetation all contribute to the species diversity of the wildlife community found at the Refuge. Fire is a critical ecological process in maintenance of successional habitats required by many species of wildlife that are of management concern within the Region.

The value of early successional habitat within the Refuge has been recognized at both the state and national levels. The Refuge has been named a Globally Important Bird Area by the American Bird Conservancy due to large Henslow's sparrow populations within the Refuge's grassland areas.

All alternatives considered within this EA deal with various combinations of 3 fire types; human-caused wildland fires, naturally occurring wildland fires and management ignited prescribed fires. Under all alternatives discussed within this EA, all human-caused wildland fires and all escaped management ignited prescribed fires will be suppressed. The following definitions are used throughout this document.

Suppression - All the work of extinguishing or confining a fire beginning with its discovery.

Management Ignited Prescribed Fire - Fire intentionally ignited to accomplish management objectives in specific areas under prescribed conditions identified in an approved Prescribed Fire Plan.

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Naturally Ignited Wildland Fire - Fire ignited by natural means (usually lightning) which is permitted to burn under specific environmental conditions, in preplanned locations, with adequate fire management personnel and equipment available to achieve natural ignition fire patterns.

Appropriate Management Response - The specific actions taken in response to a wildland fire to implement protection and/or fire use objectives.

Past use history of the Refuge by the Army, as a munitions testing area, has lead to the contamination of many areas of the Refuge by unexploded ordnance (UXO) and depleted uranium (DU) a radioactive material used for testing. All areas of the Refuge are considered contaminated by UXO or DU and all UXO and DU safety measures outlined in this EA must be followed. While the complete health affects of burning in areas containing DU and other contaminants are unknown, current scientific evidence available suggests that DU is not readily dispersed through fire and that the exposure level is an order of magnitude lower than the U.S. Environmental Protection Agency action level (Williams et. al. 1998). Safety measures in place to avoid UXO hazards are more restrictive than safety measures advised for DU and other contaminants. At all times we will utilize the more restrictive UXO safety measures.

Suppression options are limited on the refuge due to the past use-history of munitions testing by the Army. All areas of the refuge may contain UXO and earth disturbing activities are generally prohibited. Certain areas of the Refuge contain DU, a radioactive material which was used by the Army during testing. Due to these contaminants, full suppression can only occur along the boundary of the refuge. The following definitions are the terms used to identify appropriate suppression responses:

Confine - To restrict the wildland fire within determined boundaries, established either prior to or during the fire. These identified boundaries will confine the fire with no direct action being taken to extinguish the fire. *At Big Oaks NWR no ground-disturbing methods can be used to implement the **Confine** strategy, except along the perimeter of the refuge, due to the presence of UXO and DU.*

Contain - To restrict a wildland fire to a defined area using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until it is out. *At Big Oaks NWR no ground-disturbing methods can be used to implement the **Contain** strategy, except along the perimeter of the refuge, due to the presence of UXO and DU.*

Control - To aggressively fight a wildland fire through the skillful use of personnel, equipment, and aircraft to establish firelines around a fire, halt the fire's spread, and

extinguish all hot spots until the fire is completely out. This strategy is an effective technique to achieve prompt control of a wildland fire. *At Big Oaks NWR no ground-disturbing methods can be used to implement the* ***Control*** *strategy, except along the perimeter of the refuge, due to the presence of UXO and DU.*

II. ALTERNATIVES

A. Alternatives not Considered for Detailed Analysis

An alternative of allowing all fires to burn at all times was initially considered but eventually dismissed as not suitable for further consideration in the development of this proposal. This alternative was rejected because it fails to meet U.S. Fish and Wildlife Service policy in regards to potential liability for losses of life and property, as well as unacceptable environmental, social, and economic costs.

B. Alternatives Carried Forward for Detailed Analysis

1. Alternative A - Management Ignited Prescribed Fire and Appropriate Management Response to Wildland Fire - The Proposed Action

This Alternative would allow the Refuge to utilize a full range of fire management tools. Management ignited prescribed fires would be used by managers to reduce fuel hazards, simulate natural fire processes, and enhance opportunities for management of prescribed natural fires. This alternative strives to maintain the 8,000 acres of grassland and 6,000 acres of other early successional habitats that currently exist within Big Oaks NWR. Suppression would occur on all fires during the period April 15 through September 15 to avoid direct impacts to Federally endangered *M. sodalis*. Known cultural resources would be protected under this and all other Alternatives.

Under this alternative all human-caused wildland fires would be suppressed. All naturally ignited wildland fires would be allowed to burn depending on the appropriate management response developed from analysis of the local situation, values-to-be-protected, management objectives, external concerns, and refuge objectives when the fire occurs. Suppression would be undertaken on naturally ignited wildland fires that threaten life, property, resources or exceed prescription limits developed for that fire. No prescribed fires will be ignited this year (2001) within any portion of the DU area.

2. Alternative B - Full Suppression - No Action

The Refuge is abiding by current Departmental and Service policies that require full suppression of all wildland fires and preclude management ignited prescribed fires for all refuges without an approved FMP. Under this alternative all ignitions, including those of both natural and human-caused origin, would be suppressed and no management prescribed fires would be conducted. This Alternative summarizes actions that the Refuge would take until we have an approved FMP (No Action Alternative).

Under this alternative all ignitions, including those of both natural and human-caused origin, would be suppressed and no management prescribed fires would be conducted. Hazard fuel reduction would be accomplished by mechanical methods to the extent practical and consistent with land management objectives. No management ignited prescribed fires would be initiated under this Alternative and therefore no management ignited prescribed fires would occur this year (2001) within the DU area. Mechanical manipulation on the Refuge would be limited to interior roadway and Refuge boundary maintenance and protection due to UXO and DU safety concerns. As with all other Alternatives, suppression would occur on all fires during the period April 15 through September 15 to avoid direct impacts to Federally endangered *M. sodalis*. Known cultural resources would be protected under this and all other Alternatives.

3. Alternative C - Management Ignited Prescribed Fire and Fire Suppression

This Alternative, like Alternative A, would enable the Refuge to use prescribed fires in pre-determined areas, within pre-planned conditions, to accomplish specific resource management objectives. Fire hazards around Refuge boundaries would be reduced under this alternative. This Alternative differs from Alternative A in that all wildland fires would be suppressed regardless of cause or location.

Like Alternative A, this Alternative strives to maintain the 8,000 acres of grassland and 6,000 acres of other early successional habitats that currently exist within Big Oaks NWR. As with all other Alternatives, suppression would occur on all fires during the period April 15 through September 15 to avoid direct impacts to Federally endangered *M. sodalis*. Known cultural resources would be protected under this and all other Alternatives. Suppression would occur on all fires during the period April 15 through September 15 to avoid direct impacts to Federally endangered *M. sodalis*. No prescribed fires will be ignited this year (2001) within any portion of the DU area.

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III AFFECTED ENVIRONMENT

A. Physical Characteristics

The area has a typical midwestern continental climate and the weather is quite variable, because of the influx of high and low pressure systems and warm moist air from the Gulf of Mexico. Summers are generally quite warm, while the winters are moderately cold. Precipitation is fairly uniform throughout the year, averaging 3 - 4 inches per month. Spring and summer thunderstorms push the monthly average over 4 inches for the March-June period, while the fall of the year sees monthly rainfalls close to 3 inches Measurable snowfall can be experienced throughout the November to March period, and averages about 15 inches annually.

Ground elevations at the Refuge are generally between 850 - 900 feet Net Geodetic Vertical Datum, with elevations along the numerous streams flowing through the area being about 30 - 50 feet lower. Site drainage is generally to the west and southwest.

B. Biological Resources

1. Habitat/Vegetation

The following habitat types were derived from 1995 and 1997 aerial photos. Photo interpretation was completed in 1998. Classifications are comparable to those used in the US GAP Analysis Project. Individual classifications were based on a minimum detection size of 5 acres. The distinction between forest and woodland is based on the amount of canopy closure. Forest areas have 60% or greater canopy closure and woodlands have 20% to 40% canopy closure.

Upland forests comprise 27,300 acres (54%) of the Refuge. The upland forest classification includes both evergreen and deciduous species ranging in age from young (~15-30 years) to mature (>50 years). The primary evergreen species at the Refuge is eastern red cedar (*Juniperus virginiana*). Dominant deciduous trees include sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*) and black gum (*Nyssa sylvatica*) on poorly drained upland depression sites. Tulip poplar (*Liriodendron tulipifera*) and white ash (*Fraxinus americana*) are the species making up the young upland forests on well drained sites. White oak (*Quercus alba*), red oak (*Quercus rubra*) and shagbark hickory (*Carya ovata*) are the dominant species on intermediate and within some mature

upland forests. American beech (*Fagus grandifolia*) and sugar maple (*Acer saccharum*) dominate the remainder of the mature upland forests.

Our second most abundant habitat at the Refuge is grasslands. This habitat type makes up 8,400 acres (17%) of the Refuge. The dominant grassland species at the Refuge appears to be broomsedge (*Andropogon* sp.).

Other habitat types at the refuge include 5,200 acres (10%) palustrian wetland, 3,100 acres (6%) woodland, 6,100 acres (12%) early successional, 150 acres (0.5%) of open water, and approximately 150 acres (0.5%) of bare soil and paved areas. Woodland species composition is comparable to that of upland forest. The palustrine wetland category includes all growth stages of palustrine vegetation including early successional and forested wetland.

2. Threatened, Endangered and Candidate Species

Big Oaks NWR is used as summer habitat by federally endangered Indiana bats (*Myotis sodalis*). Mist netting efforts by Service personnel have documented use of all riparian corridors within the Refuge by *M. sodalis* and all areas of the Refuge are considered summer habitat of *M. sodalis*.

Big Oaks NWR is within the range of the federally threatened bald eagle (*Haliaeetus leucocephalus*). *H. leucocephalus* have previously utilized the refuge as a wintering area. No *H. leucocephalus* are known to nest or utilize the Refuge during the breeding season. All riparian and lacustrine, palustrine and riverine and adjacent habitats would be considered suitable for *H. leucocephalus*.

3. Other Wildlife Species

The Refuge provides habitats for, and subsequently attracts, an abundance of wildlife species. Twenty-two species of amphibians, 17 species of reptiles, 46 species of mammals, and over 200 species of birds have either been recorded or can reasonably be expected to be present on the Refuge for a portion of the year.

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C. Land Use

The Refuge is situated on over 50,000 acres in southeastern Indiana within Jefferson, Ripley and Jennings Counties. The nearest communities are Madison, Indiana, about 5 miles south of the southern boundary of the refuge, and Nebraska and Holton, Indiana, about 1 mile north of the northern site boundary. Land use within the 3 county's 758,000 acre area is predominantly agriculture (67%).

D. Cultural/Paleontological Resources

Several Native American groups including the Miami, Wea, Piankawhaw, and Shawnee inhabited eastern Indiana, where they lived in summer agricultural villages and winter temporary hunting/trapping camps. Later arrivals in the area included the Delaware, Potawatomi, and Kickapoo groups (Stafford 1985:2-15). The Delaware and the Potawatomi are reported to have occupied the land east of Butlerville in Jennings County (Leland et al. 1956:89) that is today part of Big Oaks NWR (Mbutu et. al. 1996). Artifacts attesting to use of the area by Native Americans can be found on the Refuge (U.S. Army 1996).

Euro-American settlement of Big Oaks NWR and its vicinity can be traced back to about 1811 (Baker 1991:7). The earliest Euro-American families in Jefferson, Jennings, and Ripley counties were subsistence farmers. Subsistence farming remained the principal occupation during the early half of the nineteenth century. The portions of Jefferson, Jennings, and Ripley counties which the Refuge now occupies had consisted of an area of dispersed farmsteads, schools, churches, cemeteries, and small crossroad communities. Artifacts documenting this use are quite evident on the landscape of the Refuge today.

E. Local Socio-economic Conditions

The population within the three counties totaled 78,074 based on the 1990 census. From 1990 to 1999, population increased an estimated 12% to 87,394 within the 3 county area. Land use within the 3 county's 306,914 ha area is predominantly agriculture (67%). In 1989, the primary employment sector was manufacturing followed by government, retail trade and services sectors.

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IV ENVIRONMENTAL CONSEQUENCES

A. Alternative A - Management Ignited Prescribed Fire and Appropriate Management Response to Wildland Fire (Proposed Action)

1. Soil and Water Resources

Implementation of this alternative would seek to minimize impacts on soil and water resources by controlling the area, timing, and intensity of management ignited prescribed fires but these impacts could not be totally eliminated. Areas of extreme fuel concentrations would be reduced under this alternative which would, in turn, decrease the likelihood of extreme fire events. Short-term impacts from management ignited prescribed fires would be greater for this alternative compared to Alternative B and the same as Alternative C. Long term impacts to soil and water impacts would be the same among all Alternatives.

2. Vegetation and Fuels

Under this alternative management ignited prescribed fires could help maintain vegetation communities and reduce accumulations of fuels which contribute to larger fires. The natural ignition pattern of fire on the landscape would likely resemble a more systematic pattern. Naturally ignited wildland fires would be allowed to occur provided sufficient resources are on hand to provide for the safety and protection of property and personnel.

In vegetation around sensitive resource areas, prescribed burning could be used to simulate the effects of natural fire. The impacts of tactical suppression operations would be similar under all alternatives. Due to the safety hazards associated with UXO and DU, suppression actions would primarily be limited to the use of natural features, roads and backing fires.

3. Wildlife

Under this alternative, conditions favorable to fire dependent wildlife species would be simulated but not in the exact manner created by natural ignitions. The use of management ignited prescribed fires would lessen the build-up of fuels and lessen the intensity of all

wildland fire types (natural or human-ignited). The distribution of habitat types, and the wildlife species that depend on these habitats, would be determined by management ignited prescribed fire location, timing, conditions, and patterns of burning and only infrequently (every 50-100 years) by naturally ignited wildland fires. Prescribed fire could be implemented to stimulate plant growth, remove non-native plant species, and eliminate downed fuels.

4. Endangered and Threatened Species

The effects of all Alternatives on federally endangered and threatened species has been evaluated in an Endangered Species Act section 7 consultation with the Bloomington, Indiana Ecological Service's Office. Initial indications are that management ignited prescribed fires under all Alternatives could be designed to avoid direct impacts to *M. sodalis*. This would by achieved by suppressing all fires between April 15 and September 15. Management ignited prescribed fires would actually improve *M. sodalis* maternity roost habitat. *M. sodalis* prefer large trees in the open or at edges, they seem to prefer open canopies and fragmented forest landscapes and they seem to prefer forests with an open understory (USFWS 1999). These are conditions that would be found in a fire altered landscape. No impacts to *H. leucocephalus* are anticipated. The effects of suppression activities on endangered and threatened species would be similar with all alternatives due to the limited disturbance imposed by UXO and DU safety considerations.

5. Cultural Resources

Known cultural resources would be protected under this and all other Alternatives. Two historic structures adjacent to, and surrounded by, the Refuge are not likely be effected in all but the most extreme fire situation. The use of management ignited prescribed fires under this Alternative would reduce fuels and lessen the chance of an extreme fire occurring. The effects of suppression activities on cultural resources would be avoided under this and all other Alternatives evaluated due to the limited disturbance imposed by UXO and DU safety considerations.

6. Visual/Aesthetics/Air Shed

This alternative could result in the greatest range of impacts on visual resources as a result of the various levels of fire intensity that could occur during a naturally ignited wildland fire. The appropriate management response to a naturally ignited wildand fire would consider visual, aesthetic and airshed impacts at the time of the initial incident and at each subsequent evaluation.

Under this Alternative, effects of management ignited prescribed fires could be controlled. Short term smoke episodes would still be possible under this alternative, but fuels reduction through management ignited prescribed fires would greatly reduce episodes of severe air pollution due to large, uncontrolled wildland fires. Given the limited range of suppression options available due to UXO and DU safety constraints, visual impacts from suppression activities would be very minor and similar under all Alternatives.

7. Visitor Use/Safety

This alternative provides for the most natural habitats for visitor use. Due to timing of fire occurrence and conditions effecting fire behavior, visitors at certain times and Refuge neighbors could be inconvenienced. Initial safety hazards are lower under this alternative than under either Alternative B or C because of reduced direct exposure of firefighters to possible UXO and DU contamination. Hazards would still be encountered while performing suppression duties due to direct flame exposure, respiratory problems associated with smoke inhalation, and the use of equipment under conditions of poor visibility.

8. Economic

Reduction of hazardous fuels near structures and other capital improvements would reduce potential economic losses from a catastrophic fire. Use of management ignited prescribed fires would minimize the risk of escaped fires due to the preplanning process associated with prescribed burning. Costs of management ignited prescribed fires is comparable to Alternative C. By utilizing the appropriate management response, for naturally ignited wildland fires, the cost of wildland fire suppression would likely be lower than suppression costs in Alternative B or C. No direct or indirect economic impact (positive or negative) to the surrounding communities is anticipated with this or any other Alternative considered.

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9. Cumulative Impacts

When reviewing the effects of a fire management program we must consider not only the effects of burning efforts at Big Oaks NWR but also the combined effects on the environment of all burning and other sources of particulate matter and overall impacts to habitats throughout the region. Cumulative impacts of the implementation of this Alternative on air quality in Indiana are minimal. No area within the region is a non-attainment air quality area and none are likely to be directly or indirectly effected to approaching a level of significance needing to be addressed .

No cumulative loss of early successional habitats or contiguous forest would result at Big Oaks NWR or within the state or region from implementation of this Alternative. This alternative strives to maintain the 8,000 acres of grassland and 6,000 acres of other early successional habitats that currently exist within Big Oaks NWR.

B. Alternative B - Full Suppression (No Action)

1. Soil and Water Resources

Impacts on water quality would be negligible with low intensity fires. Over time, with the build-up of fuels, the chance of a severe fire would increase. In the event a high intensity fire did occur, an increase in surface runoff leading to soil erosion and siltation could be expected. The long-term impacts to soil and water resources is estimated to be comparable among all Alternatives considered.

2. Vegetation and Fuels

This alternative could create an unnatural increase in fuel conditions leading to increased potential for larger wildland fires with greater intensities. The elimination of frequent, light-burning fires would change the composition of vegetation and allow the hazardous build-up of combustible fuels. This could result in more extreme burning conditions in which wildland fires become larger and more dangerous. Over time, as the present early successional vegetation is replaced by mature forest, fire behavior would be expected to decrease. Full suppression without the inclusion of management ignited prescribed fires would reduce species diversity by excluding fire dependent, shade intolerant species. The effects of suppression efforts on vegetation and fuels would be similar to Alternatives A

and C since UXO and DU safety considerations would prevent intensive suppression efforts on areas of the Refuge other than the perimeter.

3. Wildlife

Species dependent upon fire influenced ecosystems could decline and be replaced by species more tolerant of conditions created when fire is removed as an ecological process. Due to UXO and DU safety considerations, the effect of suppression impacts would be similar among all Alternatives.

4. Endangered and Threatened Species

The effects of all Alternatives on federally endangered and threatened species is currently being reviewed in an Endangered Species Act section 7 consultation with the Bloomington, Indiana Ecological Service's Office. This consultation is being conducted concurrently with the drafting of this EA. No impacts to *H. leucocephalus* are anticipated. The effects of suppression activities on endangered and threatened species would be similar with all alternatives due to the limited disturbance imposed by UXO and DU safety considerations.

Fires under all Alternatives would be suppressed between April 15 and September 15 to avoid direct impacts to *M. sodalis*. Management ignited prescribed fires are designed to improve *M. sodalis* maternity roost habitat. Suppression of all fires and removal of management ignited prescribed fires would alter the landscape over time creating a more closed forest system without the open understory and openings preferred by *M. sodalis*. Adoption of this Alternative would lead to indirect impacts occurring to *M. sodalis*.

5. Cultural Resources

The limited use of earth-disturbing suppression activities due to UXO and DU contamination would likely significantly reduce or eliminate impacts to cultural resources. Cultural resources susceptible to damage by fire could be degraded by high intensity fires beyond the ability of suppression forces to control or within areas where the suppression cannot go due to UXO and DU safety considerations. High intensity fires are more likely to occur under this alternative due to the accumulation of dead vegetation and downed woody materials (excess fuels) as a result of total fire suppression.

6. Visual/Aesthetics/Air Shed

This alternative eliminates short term effects such as scorching of vegetation that result from smaller, and more frequent prescribed fires. Infrequent high intensity fires which could occur over time would result in considerable changes in the appearance of affected areas. Under this alternative there would be a short term reduction in the generation of particulate emissions from fires because of control actions. However, there is the potential for severe episodes of air pollution due to large, uncontrolled wildland fires.

7. Visitor Use/Safety

There are minimal appreciable short term impacts on Refuge visitor use under this alternative. Visitor interpretation of the Refuge would be influenced by the unnatural composition of Refuge habitats. Open areas could be potentially closed to visitor use and access during suppression activities. Wildland fire suppression is hazardous by nature. The inherent safety risks associated with small fires are compounded on larger, high

intensity fires, not only for firefighters, but for the public as well. Hazards include direct flame exposure, respiratory problems associated with smoke inhalation, and the use of equipment under conditions of poor visibility.

8. Economic

Reduction of hazardous fuels near structures and other capital improvements through the use of management ignited prescribed fires would not occur under this Alternative. Due to the build-up of hazardous fuels, the threat to capital improvements would be greater under this alternative than under either Alternative A or C. Costs associated with the suppression program steadily increase with the accumulation of fuel. High intensity fires potentially would be costly to suppress and could cause economic disruption through the loss of natural resources, capital improvements, visitor access opportunities, and deteriorated visitor experiences. The suppression program would be limited by the presence of UXO and DU contamination. This would reduce the ability of firefighters to directly attack the fire and require more costly aerial suppression. No direct or indirect economic impact (positive or negative) to the surrounding communities is anticipated with this or any other Alternative.

9. Cumulative Impacts

When reviewing the effects of a fire management program at Big Oaks NWR combined with effects on the environment of all burning and other sources of particulate matter throughout the region, cumulative impacts are minimal. No area within the region is a non-attainment air quality area and none are likely to be directly or indirectly effected to approaching a level of significance needing to be addressed .

A significant increase in mature and contiguous forests would occur through time under this Alternative. Benefits to interior forest migratory birds and animals would likely occur over time.

Significant cumulative loss of early successional habitats and would occur. This alternative would lead to the loss of 8,000 acres of grassland and 6,000 acres of other early successional habitats that currently exist within Big Oaks NWR. This loss when combined with the over 99% reduction in native grasslands statewide is significant. Furthermore, it is likely that if these grasslands are lost, it may be necessary to re-evaluate the status of Henslow's sparrow under the Endangered Species Act. Therefore, if Alternative B were to become the selected Alternative, the Service would prepare an Environmental Impact Statement to analyze the impacts of this Alternative.

C. Alternative C - Management Ignited Prescribed Fire and Fire Suppression

1. Soil and Water Resources

Due to the low frequency of naturally ignited wildland fires (every 50-100 years) anticipated under Alternative A, water quality and soil resource impacts would be considered the same as Alternative A. Impacts from management ignited prescribed fires would also be the same as Alternative A.

2. Vegetation and Fuels

Impacts to vegetation and fuels would be similar to Alternative A, management ignited prescribed fires could help maintain historic vegetation communities and reduce

accumulations of fuels which contribute to larger fires. The impacts of tactical suppression operations against wildland fires would be similar to those described under Alternative A and B.

3. Wildlife

Fewer instances of human induced change would be imposed upon Refuge habitats compared to Alternatives B. Effects on wildlife would be the same as under Alternative A except that the natural ignition pattern of fire on the landscape would likely be replaced by a more systematic pattern with the exclusion of naturally ignited wildland fires. Due to UXO and DU safety considerations, the effect of suppression impacts would be similar among all Alternatives.

4. Endangered and Threatened Species

The effects of all Alternatives on federally endangered and threatened species is currently being reviewed in an Endangered Species Act section 7 consultation with the Bloomington, Indiana Ecological Service's Office. This consultation is being conducted concurrently with the drafting of this EA. Initial indications are that management ignited prescribed fires under this Alternative and under Alternative A could be designed to avoid direct impacts to *M. sodalis*. This would by achieved by suppressing all fires between April 15 and September 15. Management ignited prescribed fires would actually improve *M. sodalis* maternity roost habitat. *M. sodalis* prefer large trees in the open or at edges, they seem to prefer open canopies and fragmented forest landscapes and they seem to prefer forests with an open understory (USFWS 1999). These are conditions that would be found in a fire altered landscape.

No impacts to *H. leucocephalus* are anticipated. The effects of suppression activities on endangered and threatened species would be similar with all alternatives due to the limited disturbance imposed by UXO and DU safety considerations.

5. Cultural Resources

The scheduled nature of burning under this alternative provides the ability to plan, locate, and consequently avoid the disturbance of known cultural resources resulting from either ignition or fire control activities. Known cultural resources would be protected under this

and all other Alternatives. Two historic structures adjacent to, and surrounded by, the Refuge are not likely be effected in all but the most extreme fire situation. The use of management ignited prescribed fires under this Alternative would reduce fuels and lessen the chance of an extreme fire occurring. The effects of suppression activities on cultural resources would be avoided under this and all other Alternatives evaluated due to the limited disturbance imposed by UXO and DU safety considerations.

6. Visual/Aesthetics/Air Shed

Areas with sensitive visual resources could be protected from fire and certain fire suppression activities under this alternative. Some visual changes would occur under this alternative, but lower intensity management ignited prescribed fires would result in minimal changes to visual aesthetics. Alternatives A and C provides a slightly higher degree of air quality management owing to the ability to schedule management ignited prescribed fires to coincide with periods of acceptable smoke ventilation to minimize impacts to roadways and developed areas. The direction of wind vector selected will be such that smoke and other particulate emissions are transported away from sensitive areas. Short term smoke episodes would still be possible under this alternative, but fuel reduction through management ignited prescribed fires would greatly reduce episodes of severe air pollution due to large, uncontrolled wildland fires.

7. Visitor Use/Safety

This alternative may entail some disruptive effects to Refuge visitors. Operational activities could limit visitor use and access to open portions of the Refuge. Smoke production could detract from visual enjoyment and further restrict access on public roads and trails. Activities associated with management ignited prescribed fire can normally be accomplished in a safe manner through pre-planning and scheduling of work tasks. Fires are ignited in a predetermined pattern and are generally of low to moderate intensity. Hazards associated with suppression of wildland fires remain the same as those associated with Alternatives A and B.

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8. Economic

Reduction of hazardous fuels near structures and other capital improvements would reduce potential economic losses from a catastrophic fire. Use of management ignited prescribed fires would minimize the risk of escaped fires due to the preplanning process associated with prescribed burning. Costs of management ignited prescribed fires is comparable to Alternative A. No direct or indirect economic impact (positive or negative) to the surrounding communities is anticipated with this or any other Alternative.

9. Cumulative Impacts

When reviewing the effects of a fire management program at Big Oaks NWR combined with effects on the environment of all burning and other sources of particulate matter throughout the region, cumulative impacts are minimal. No area within the region is a non-attainment air quality area and none are likely to be directly or indirectly effected to approaching a level of significance needing to be addressed .

Cumulative impacts for this alternative is the same as Alternative A. No cumulative loss of early successional habitats or contiguous forest would result at Big Oaks NWR or within the state or region from implementation of this Alternative. This alternative strives to maintain the 8,000 acres of grassland and 6,000 acres of other early successional habitats that currently exist within Big Oaks NWR.

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D. Summary of Environmental Consequences by Alternative

	Alternative A (Proposed Action)	Alternative B (No Action)	Alternative C
Soil and Water Resources	Minor short-term impacts from prescribed fires	No short term impacts	Minor short-term impacts from prescribed fires
Vegetation and Fuels	No change from current condition is expected. A more natural landscape will result from natural wildland fires.	Gradual increase in size of vegetation and fuels and possible severe fire activity	No change from current condition is expected
Wildlife	No immediate change from current condition is expected. A more natural assemblage of species will result from natural wildland fires over time.	Gradual elimination of species that depend on early successional vegetation.	No change from current condition is expected
Endangered and Threatened Species	No change from current condition is expected	Gradual reduction in suitability of habitat for *M. sodalis*.	No change from current condition is expected
Cultural Resources	No change from current condition is expected	No change from current condition is expected	No change from current condition is expected
Visual/Aesthetics/ Air Shed	Impacts would be variable and unpredictable but not as extreme as Alternative B.	Periodic extreme fire events could cause impacts to visual/aesthetics/air shed.	No change from current condition is expected

APPENDIX K

	Alternative A (Proposed Action)	Alternative B (No Action)	Alternative C
Visitor Use/Safety	Greater safety to firefighting personnel than other Alternatives and no change in visitor use expected.	Increased risk to firefighting personnel but no change in visitor use expected.	Increased risk to firefighting personnel but no change in visitor use expected.
Economic	Lower risk to structures on the Refuge. No economic impact off Refuge.	Increased risk to Refuge structures due to build-up of dangerous fuels. No economic impact off Refuge.	Lower risk to structures on the Refuge. No economic impact off Refuge.
Cumulative Impacts	No change from current conditions.	Significant increase in contiguous forest. Significant reduction in valuable early successional habitats on the Refuge and across the state.	Same as Alternative A.

V. List of Preparers

Steve Miller, 1661 W JPG Niblo Rd. Madison, IN 47250

VI. Coordination and Consultation With the Public and Others

During the preparation of the Big Oaks NWR's FMP and this EA, consultation and coordination occurred between this office and numerous state and federal agencies. Endangered Species intra-Service Section 7 consultation was completed concurrently with the review of this EA by the public. The Intra-Service Section 7 Consultation is now complete and no changes were needed to the FMP or the EA.

APPENDIX K

Maintaining a good working relationship with various agencies in Indiana is essential to the overall fire management program. Throughout the planning stages of this document, the Service was in direct contact many organizations. The following agencies were given and asked to comment on preliminary drafts of the FMP and EA:

U.S. Army

U.S. Fish and Wildlife Service's Ecological Services Office at Bloomington, Indiana

Hoosier National Forest

Indiana Department of Natural Resources Division of Forestry

Indiana Air National Guard

New Marion Volunteer Fire Department

Through these contacts, during the planning and writing process, the Service was able to identify the concerns of these agencies and, where possible, incorporate their concerns and suggestions into this document.

This EA was made available for public comment from January 30 through March 1, 2001. We received one response from Save The Valley, Inc. and their letter is attached. Changes were made to this EA in response to their letter in order to clarify our actions. A summary of these changes is included in our response to their letter in Attachment 1. These changes were not considered significant and therefore a second draft of this EA was not made available for public comment prior to the final EA being adopted.

APPENDIX K

SECTION VII

Comments Received

SAVE THE VALLEY

SAVE THE VALLEY, INC., P.O. BOX 813, MADISON, IN 47250
phone & fax: (812) 265-4577; e-mail: phill@venus.net
Protecting the Ohio River Valley environment since 1974

February 26, 2001

Big Oaks National Wildlife Refuge
Attn: Steve Miller
1661 West JPG Niblo Road
Madison, IN 47250

Dear Mr. Miller:

We have read the recently released Big Oaks National Wildlife Refuge Fire Management Plan and accompanying Environmental Assessment and appreciate the opportunity to comment on the plan.

First, let me say that we at Save the Valley (STV) generally defer to the expertise of the U.S. Fish & Wildlife Service and its most competent employees at Big Oaks. The plan as outlined seems to us to be well thought out. It also seems that the proposed strategy would be the best selection to attain the stated goals and objectives. Additionally, we should say that we agree with those goals and objectives.

1 We do have one concern pertaining to the plan. This has to do with the intention to conduct prescribed burns in the area that contains depleted uranium (DU). As you probably know, STV is currently researching the potential hazards that this DU may present. In our consultation with experts in toxicology, radiation hazards, and risk assessment, we have been advised that one potential problem associated with DU is inhalation or ingestion of fine particles of DU (DU dust). While the greatest part of the DU at Big Oaks is contained in relatively large pieces (whole or nearly whole projectiles and relatively large fragments) there may be some DU dust present.

2 It is our opinion that burning in the DU area may cause some of this DU dust to become airborne. This dust could then be inhaled or ingested by F&WLS personnel and possibly even by other persons both on and off the Big Oaks site.

3 We would advise that prescribed burns in the DU area not be conducted, at least until more information becomes available. The issue of the possible results of burning within the DU area should be discussed during the DU License Termination process. Thus, the Nuclear Regulatory Commission (NRC) may ultimately advise whether or not such burning should be allowed.

4 Therefore, we would recommend that prescribed burning not be conducted in the DU area unless and until the health and safety risks of burning in the DU area are completely understood.

Sincerely,

Richard Hill
President, STV

APPENDIX K

Response to Comments

Save The Valley

1. Comment noted. Prior to including these areas within our management ignited prescribed fire areas, we reviewed data available on DU and DU/fire interactions and asked Fish and Wildlife Service environmental contaminant specialists to examine this same data. Based upon allowable exposure thresholds and data available on DU and DU/fire interactions it was determined that, even using conservative risk scenarios, fire was unlikely to increase DU exposure to fire personnel or the environment to a level approaching significance. Given this data and the fact that no new data was presented we have not changed our proposed burn boundaries.

2. We have included a citation (Williams et. al. 1998) in this final EA for a study on the dispersion and therefore possible human exposure of DU associated with fires. Current data available suggests that levels of DU carried in smoke associated with burning natural vegetation is not significant. This is the only study we know of that looks at dispersion of DU in smoke in a setting similar to the conditions that are found on the refuge. Exposure of fire personnel would be limited due to the safety constraints associated with UXO. Fire personnel leave the area immediately following ignition and then only return on a periodic basis for monitoring.

3. We have included text within the EA indicating that we are not proposing to conduct burns within the DU area this year (2001). Provided no new data is made available demonstrating a significant risk (or a risk approaching significance) to the public, fire personnel or the environment, we propose burning in areas containing DU in the future to maintain valuable habitat. The Service has requested that the U.S. Army and the Nuclear Regulatory Commission review the affects of fire and DU specifically for refuge activities in any future environmental reviews concerning DU. This is to ensure that we are provided the most up-to-date information regarding DU. We would encourage all parties to make available internal data on DU and fire that they may have in order for us to make the most informed decision possible.

4. Comment noted. For the reasons explained in 1-3 above and given no new data presented we have not changed our proposed burn boundaries to exclude the DU area.

APPENDIX L

INTRA-SERVICE
SECTION 7 CONSULTATION

INTRA-SERVICE SECTION 7 EVALUATION FORM

Originating Person: Steve Miller
Telephone Number: (812) 273-0783
Date: January 25, 2001

I. Region: 3

II. Service Activity: Refuges and Wildlife

III. A. Listed species and/or their critical habitat.
Indiana bat (*Myotis sodalis*). No critical habitat.
bald eagle (*Haliaeetus leucocephalus*). No critical habitat.

B. Proposed species and/or proposed critical habitat. NOT APPLICABLE

C. Category 1 candidate species. NOT APPLICABLE

D. Include species/habitat occurrence on a map. All forested and palustrine areas shown on the vegetation map (Figure 2) may provide summer habitat for *M. sodalis* and suitable habitat for *H. leucocephalus*.

IV. Geographic area or station name and action. Big Oaks National Wildlife Refuge (NWR), Madison, Indiana. This consultation is in support of the Proposed Action identified within the Environmental Assessment (EA) (Appendix K) for the Fire Management Plan at Big Oaks NWR.

V. Location:

A. County and State: Jefferson, Ripley and Jennings Counties, Indiana (Figure 1).

B. Section, township, and range: All or portions of :
T7N R9E SEC 24 and 25;
T7N R10E SEC 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34 and 35
T6N R10E SEC 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30 and 31
T5N R10E SEC 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34 and 35

C. Distance (miles) and direction to nearest town: Holton is 1 mile north and Madison is 4 miles south of the Refuge.

VI. Action objectives:

This proposal entails adopting the Proposed Action as outlined within the EA prepared for the Fire Management Plan for Big Oaks NWR. The Fire Management Plan will be used to guide future fire suppression and prescribed fire management efforts at Big Oaks NWR. Following the completion of this consultation and based on the evaluation of public comments on the EA, the Regional Director (Region 3) of the Fish and Wildlife Service may make a Finding on No Significant Impact (FONSI) determination and adopt the Proposed Action. The Regional Director may also select one of the other alternatives as presented in the EA or to select an entirely new alternative that was not developed for the EA. Should an Alternative other than the Proposed Action be selected a new consultation would be required.

VII. Determination of effects:

A. Explanation of impacts of action on listed species/critical habitat

1. *M. sodalis* at Big Oaks National Wildlife Refuge

The U.S. Fish and Wildlife Service (Service), Bloomington Field Office, surveyed bats on what was the Jefferson Proving Ground and is now Big Oaks NWR during the summers of 1993, 1994 and 1995. In 1998, 1999 and 2000, bat surveys were conducted by Service staff stationed at Big Oaks NWR. Documenting the presence or absence of populations of Indiana bats was the primary objective of our survey efforts from 1993-1995 and 1998-2000. Twenty sites were surveyed during the 6-year period throughout the 50,000 acre Refuge (Figure 9).

A total of 626 individuals representing 7 species of bats, including Indiana bats, was captured on Big Oaks NWR during the 6-year survey. Sites at which Indiana bats were captured were distributed throughout the Refuge.

At Big Oaks NWR, 27 of 35 Indiana bats captured were adult females or juveniles, and the remaining 8 were adult males. We estimate that Big Oaks NWR supports a minimum of 6 Indiana bat maternity colonies; colonies are distributed across the Refuge. This is a conservative estimate; additional mist netting would likely yield evidence of additional maternity colonies.

Indiana bats were captured at 50% of the sites sampled on Big Oaks NWR at a rate of 0.19 Indiana bats per net night. Brack (1983) captured Indiana bats at 33% of riparian sites sampled at a rate of .36 bats/net night during 3 years of mistnetting in Indiana. Whitaker (1994) captured 1 Indiana bat in 10 net nights (1 net night at each of 10 different sites) in Jennings County. Capture rates can not be used to estimate population size. However, the capture rates and the fact that captures were well distributed across the property suggests that Big Oaks NWR provides a concentration of suitable Indiana bat summer habitat.

Fourteen adult Indiana bats were fitted with radio transmitters during the 6-year study period. Radio-tagged bats included 10 reproductive females, 3 nonreproductive female, and a male. Roost locations of radio-tagged bats were determined to the extent feasible; some were located in restricted areas or never located. We were able to identify 10 roost trees (for the other bats, we were only able to determine a general roost tree location or they were never relocated). Roost trees identified on Big Oaks NWR included 2 black locusts (dead), 4 American elms (dead), 3 shagbark hickories (live), and 1 red maple (dead).

Indiana bat roosts are ephemeral, frequently associated with dead or dying trees. Most roost trees may be habitable for only 2-8 years (depending on the species and condition of the roost tree) under natural conditions. Gardner et al. (1991) evaluated 39 roost trees and found that 31% were no longer suitable the following summer, and 33% of those remaining were unavailable by the second summer. A variety of suitable roosts are needed within a colony's traditional summer range for the colony to continue to exist (Kurta et al. 1993). Bats move among roosts within a season and when a particular roost becomes unavailable from one year to the next. It is not known how many alternate roosts must be available to assure retention of a colony within a particular area.

Callahan (1993) noted: "Larger forest tracts probably increase the chances that a suitable range of roost trees will be present in the stand. Large forest components also provide an additional benefit to a philopatric species that uses an ephemeral resource (snags) for roosting." Kurta et al. (1996) noted that a relatively large area is needed to meet the roosting requirements of Indiana bats; young, highly fragmented forests, typical in the midwestern United States, can not meet these requirements. Big Oaks NWR is the largest forested block available to Indiana bats over a large geographic area. The availability of roost trees on Big Oaks NWR was not quantitatively evaluated. However, based on visual inspection, most areas of Big Oaks NWR appear to provide a good supply of potential roost trees. In the immediate area of all of the roost trees which were identified, there were numerous potential alternate roost trees.

Impacts of the Fire Management Plan Proposed Action on *M. sodalis* at Big Oaks NWR

Based upon 1997 aerial photo data, there are 34,000 acres of total forested area on Big Oaks NWR. It is anticipated that implementation of the Fire Management Plan will not negatively impact the relative abundance of forests on the Refuge. The establishment of the refuge combined with implementation of the proposed FMP is likely to increase areas of interior forest. Wildland or management ignited prescribed fires will most likely burn some understory vegetation, but it is not expected to be intense enough to kill overstory trees. Due to the presence of unexploded ordnance within the burn units, we are unable to control fire spread to forested habitats within individual areas. We are also unable to evaluate fuel levels adjacent to and within forested areas to determine the likelihood of spread into these areas. Suppression efforts, if any are required, would confine or contain a wildland or management ignited

prescribed fire to a designated unit through the use of natural (e.g. creeks) and man-made (e.g. roads) features.

Implementation of the Proposed Action is not likely to adversely affect *M. sodalis*. Of the 10 Indiana bat roost tree locations which were identified on Big Oaks NWR, 4 were in areas which have been repeatedly burned by the Army. Although detailed fire histories of these areas are not available, we do know that most areas of the Refuge have been repeatedly burned by the Army since 1980 and it is likely that these areas have been periodically burned for several decades. Through radio telemetry we discovered 2 roost trees used by an Indiana bat maternity colony in July 1998 that were within an area burned in March 1998. We conclude that the burning of these areas did not destroy Indiana bat roosting habitat.

Conditions for roosting and foraging bats may be enhanced by periodic fires. The forested stands on Big Oaks NWR which have been periodically burned are typically characterized by an open understory. Forest stands with a closed canopy and open understory are considered favorable for Indiana bat foraging habitat. Some of these burned areas also tend to have large, widely scattered trees, a condition which may be conducive to the development of roost trees. Callahan (1993) found that most primary roosts were snags in open-canopy situations.

2. *H. leucocephalus* at Big Oaks National Wildlife Refuge

Based upon 1997 aerial photo data, there are 34,000 acres of total forested area on Big Oaks NWR. It is anticipated that implementation of the Fire Management Plan will not negatively impact the relative abundance of forests on the Refuge. The establishment of the refuge combined with implementation of the proposed FMP is likely to increase areas of interior forest over time. Wildland or management ignited prescribed fires in forested areas will most likely burn some understory vegetation, but it is not expected to be intense enough to kill overstory trees. Due to the presence of unexploded ordnance within the burn units, we are unable to control fire spread within forested habitats. We are also unable to evaluate fuel levels adjacent to and within forested areas to determine the likelihood of spread into these areas. Suppression efforts, if any are required, would confine or contain a wildland or management ignited prescribed fire to a designated unit through the use of natural (e.g. creeks) and man-made (e.g. roads) features.

No surveys have been conducted specifically for *H. leucocephalus* on Big Oaks NWR. The Refuge is outside of the State of Indiana's annual *H. leucocephalus* aerial survey area. The Refuge staff have reported the presence of *H. leucocephalus* at Old Timbers Lake during winter periods when the lake was ice-free (1998 and 1999) and along an ice-free stream during late-winter periods (1999). All sightings have been of immature birds. No adult *H. leucocephalus* have been observed nor have any *H. leucocephalus* been observed during the

nesting period or exhibiting nesting behavior. No impact is anticipated on *H. leucocephalus* with adoption of the Proposed Action.

B. Explanation of impacts of action on proposed species/critical habitat. NOT APPLICABLE

C. Explanation of actions to be implemented to reduce adverse effects

1) No prescribed burns will be conducted during the period when Indiana bats are known to occupy Big Oaks NWR (April 15 - September 15) without conducting an individual section 7 consultation for each burn.

2) The Ecological Services office in Bloomington, IN will be notified prior to management ignited prescribed fires occurring at Big Oaks NWR.

3) All wildland fires will be suppressed from April 15 to September 15 to avoid direct mortality to bats.

4) The option to allow naturally ignited wildland fires to burn outside of the April 15 - September 15 period will only be considered after notifying the Ecological Services office in Bloomington.

VIII. Effect determination and response requested.

A. Listed species/critical habitat

Indiana bat (Myotis sodalis)

Determination	Response
___ no effect	___ concurrence
___ beneficial effect	___ concurrence
_X_ is not likely to adversely affect	_✓_ concurrence
___ is likely to adversely affect	___ formal consultation

bald eagle (*Haliaeetus leucocephalus*)

Determination	Response
_X_ no effect	✓ concurrence
___ beneficial effect	___ concurrence
___ is not likely to adversely affect	___ concurrence
___ is likely to adversely affect	___ formal consultation

B. Proposed species/proposed critical habitat: NOT APPLICABLE

Project Leader:

Lee Herzberger Date: 2-23-01

Lee Herzberger

IX. Field Office evaluation.

A. Concur ✓ Do not concur _____

B. Comments:

Field Supervisor:

Scott Pruitt Date: 2/28/01

Scott Pruitt

APPENDIX M

BIBLIOGRAPHY

APPENDIX M

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APPENDIX N

NEPA COMPLIANCE

Facility: Big Oaks National Wildlife Refuge
Title: Fire Management Plan Environmental Assessment

FINDING OF NO SIGNIFICANT IMPACT

For the reasons briefly presented below and based on an evaluation of the information contained in the supporting references enumerated below, I have determined that the implementation of the management ignited prescribed fire and wildland fire suppression program as described in Alternative A in the Environmental Assessment of the Fire Management Plan for Big Oaks National Wildlife Refuge, is not a major Federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969. An Environmental Impact Statement will, accordingly, not be prepared.

Reasons:

1 Protection of life and property through wildfire suppression is critical and is the main focus of this fire management plan.

2. Reduction of fuels through prescribed burning will greatly reduce the number or severity of wildland fires thereby reducing the risk to life and property.

3. Maintenance of grasslands and other early successional habitats through prescribed fire will greatly benefit several Service trust species that are declining region wide.

Mitigating Measures:

In order to avoid impacts to the Indiana bat (*Myotis sodalis*), a Federally endangered species, no prescribed burning will be conducted between the dates of April 15 and September 15.

2. In order to minimize impacts to the *M. sodalis*, all wildland fires occurring between April 15 and September 15 will be suppressed in a manner that minimizes the size of the wildand fire while recognizing the unique safety hazards associated with suppression in an area containing unexploded ordnance and other contaminants.

3. Unexploded ordnance hazard zones will be established by the refuge manager, wildland fire incident commander or prescribed fire burn boss for all fires occurring on the refuge. These zones will be based on the potential fragmentation range of ordnance as advised by the U.S. Army. All access within this zone is prohibited except by authorization of the refuge manager, wildland fire incident commander or prescribed fire burn boss.

4. A review of this plan will be conducted annually to determine if burning within areas of the refuge that contain contaminants including depleted uranium, resulting from past Army

use, pose a risk to the public, fire management personnel, or the environment. No prescribed fires are planned to occur in areas containing depleted uranium during the current fire management year (2001).

5. No impacts to cultural resources are anticipated by this action.

Supporting References:

1. Environmental Assessment Checklist
2. Environmental Assessment
3. Section 7 Consultation
4. Fire Management Plan

Regional Director, FWS, Region 3

Date: 3/02/01

Distribution:
Wash., DC (OEC)
State Clearinghouse